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(54) **Disposable body fluids absorbent padding**

Wegwerfbares Kissen zum Absorbieren von Körperflüssigkeiten

Coussin à jeter pour absorber des liquides corporels

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Description

[0001] The present invention relates to a disposable body fluids absorbent padding and more particularly, to a disposable body fluids absorbent padding such as a menstruation pad, a diaper for infants, a diaper for incontinence and the like having a topsheet capable of concealing body fluids having been absorbed by a core in the padding.

[0002] It is well known to use a hydrophobic nonwoven fabric as material for a topsheet not only to alleviate an uncomfortable feeling of wetness for a wearer's skin due to body fluids but also to enhance a body fluids permeability. However, this topsheet is generally poor in its capability of preventing the body fluids once having been absorbed by the core from flowing backward (i.e., resulting in rewetting) and often give a wearer the feeling of wetness due to such flowing backward. This topsheet is poor also in capability of concealing the body fluids having been absorbed by the core and, for example, in the case of a menstruation pad, the core smeared with menstrual discharge is often uncomfortably remarkable for a wearer when the used pad is disposed.

[0003] In connection with the above-mentioned smear concealing capability of the topsheet, Japanese Laid-Open Patent Application No. Sho 57 - 1340 teaches that it is effective to use a hydrophobic film having openings each of an equivalent hydraulic diameter less than 0.635mm (0.025") as the topsheet. This reference teaches also that a thin layer comprising uniformly distributed fluff pulp or synthetic fiber may be bonded to the inner surface of the film with the thin layer being in contact with the core during use and thereby body fluids permeation to the core may be promoted. However, the film disclosed in this reference is nothing but so-called plastic film presenting the touch falling far short of that presented by a nonwoven fabric and too closely contacting a wearer's skin, often causing stuffiness or eruption.

[0004] EP-A-0489205 and EP-A-0587118 both disclose absorbent padding material having a liquid-permeable topsheet, a liquid-impermeable backsheet and a liquid-absorbent core between the sheets. The topsheet comprises a layer of liquid-permeable non-woven fabric and a layer of plastics material integrally bonded on top of the non-woven fabric. The plastics layer has a plurality of apertures through which the non-woven fabric is exposed.

[0005] US-A-4397644 discloses a sanitary napkin comprising a fluid pervious cover and a thermoplastic-containing comfort enhancing layer which surrounds an absorbent layer. The comfort enhancement layer has transfer zones of increased density and compression to integrate the cover to a transfer layer of the comfort enhancement layer.

[0006] In view of these problems, it is a principal object of the invention to provide an improved disposable body fluids absorbent padding allowing the above-mentioned problems left behind by the prior art unsolved to

be solved.

[0007] Accordingly, the present invention consists in a disposable body fluids absorbent padding comprising a liquid-permeable topsheet, a liquid-impermeable backsheet and a liquid-absorbent core disposed between these two sheets, wherein said topsheet comprises a liquid-permeable nonwoven fabric and a liquid-impermeable plastics film integrally bonded to the upper surface of said nonwoven fabric so as to partially expose the upper surface of said nonwoven fabric, characterised in that each zone of said nonwoven fabric covered with said plastics film is of a higher density than the density of each zone of said nonwoven fabric not covered with said plastic film.

[0008] Preferably, each of said higher density zones presents a density corresponding to 1.4 times or higher than a density presented by each of said lower density zones and said higher density zones and said lower density zones are alternately arranged so as to form a striped pattern.

[0009] Preferably, component fibers of said nonwoven fabric in said higher density zones are arranged substantially with a desired orientation.

[0010] Preferably, said plastics film is substantially translucent or opaque.

[0011] In the body fluids absorbent padding constructed as described above, the topsheet is exposed to a wearer's skin in the low density zones but the high density zones are covered with the respective strips of plastic film. Most of discharged body fluids are absorbed through the low density zones into the liquid-absorbent core, then diffuse in a direction of thickness as well as in a direction of the surface of said core. As a result, the core becomes so-called smeared. The core smeared with body fluids is partially covered with the strips of plastic film partially covering the topsheet and therefore the smear is not remarkable. A quantity of body fluids staying in the low density zones is transferred under the capillary action into the high density zones which are also smeared with body fluids but the strips of plastic film covering these high density zones effectively conceal such smear. On the other hand, a quantity of body fluids staying in the low density zones is effectively reduced owing to said transfer and therefore the smear in these low density zones is also not remarkable.

[0012] The invention will now be described by way of example with reference to the accompanying drawings, wherein:-

Fig. 1 is a perspective view showing a menstruation pad according to one embodiment of the invention as partially broken away;

Fig. 2 is a sectional view taken along a line X - X in Fig. 1; and

Fig. 3 is a plan view showing a variant of a topsheet used in the embodiment shown in Fig. 1.

[0013] Referring to Fig. 1, a pad 1 comprises a top-

sheet 2, a backsheet 3 and a liquid-absorbent core 4 disposed between these two sheets 2, 3 wherein the top- and backsheets 2, 3 are water-tightly bonded to each other by a sealing line 5 along their portions extending outward beyond a peripheral edge of the core 4. The topsheet 2 is made of a liquid-permeable nonwoven fabric 7 and provided on its upper surface along longitudinally of the pad 1 with a plurality of strips 8 of substantially translucent or opaque plastic films which are liquid-impermeable or air-permeable but liquid-impermeable and preferably water-repellent. The backsheet 3 is made of a liquid-impermeable plastic film. The liquid-absorbent core 4 is made of fluff pulps mixed with high water absorption polymer powders and this mixture may be further mixed with thermoplastic synthetic fibers or entirely covered with a tissue paper.

[0014] Referring to Fig. 2, the nonwoven fabric 7 forming the topsheet 2 comprises transversely alternate longitudinal high and low density zones 10, 11 of width W_A , W_B , respectively, which alternate transversely of the pad 1. Each of the high density zones 10 has its upper surface covered with the film strip 8 of the width W_A bonded thereto and each of the low density zones 11 has its upper surface exposed to a wearer's skin. The nonwoven fabric 7 preferably comprises 20 to 100% by weight of thermoplastic synthetic fibers so as to present a weight per unit area of 5 to 200g/m² wherein the high density zone 10 has a density of 0.03 or higher and the low density zone 11 has a density of 0.005 to 0.4, i.e., the density of the zone 10 is 1.4 times or higher than the density of the zone 11. These densities should be understood here to be apparent densities calculated on the basis of thicknesses which were measured under a surface pressure of 3g/cm² exerted on the nonwoven fabric. While the pad 1 is shown as having the high density zones 10 and the film strip 8 heat sealed together under a pressure, this sealing may be achieved also with use of suitable adhesive or by disposing other weldable film strips between the high density zones 10 and the film strips 8.

[0015] The topsheet 2 has its lower surface 12 in contact with the upper surface 13 of the core 4 so that menstrual discharge may be guided through the topsheet 2 into the core 4. More specifically, menstrual discharge can permeate only the low density zones 11, then is guided into the underlying core 4 having a high water holding capacity as well as into the adjacent high density zones 10, and substantially no quantity of menstrual discharge stays in the low density zones 11. The core 4 as well as the high density zones 10 thus smeared with menstrual discharge are partially or entirely covered with the film strips 8 effectively serving to prevent this smear from being remarkable. The topsheet 2 functioning in this manner will facilitate menstrual discharge to be guided longitudinally of the pad 1 in the density zones 10 and allow the respective high density zones 10 to be effectively utilized from end to end when fibers at least in the high density zones 10 are oriented longitudinally of the pad 1. Additionally, the top surfaces of the low

density zones 11 are higher than those of the film strips 8 and form mountain- or wave-like shapes (See Fig. 2). It is obvious that the pad 1 gives a wearer no feeling of wetness due to the absorbed quantity of menstrual discharge.

[0016] Referring to Fig. 3, in another embodiment, elliptical low density zones 11 are intermittently arranged in a plastic film 8 which is continuous both in length and width and the high density zone 10 (not shown) is bonded to the film 8. The film 8 extends both in length and width and has a plurality of longitudinally long elliptical apertures 14 where the low density zones 11 substantially in the same form as said apertures 14 are positioned. Thus menstrual discharge once having been transferred to the high density zone 10 may be further diffused both longitudinally and transversely as viewed in Fig. 3 and thereby the high density zone 10 may be utilized more efficiently than in the case shown by Fig. 1.

[0017] While an area ratio between the high density zones 10 and the low density zones 11 in the topsheet 2 is not critical to the invention, it is preferred for menstruation pads or disposable diapers to be designed so that the high density zones 10 occupy 30 to 70% of the entire topsheet 2. To alleviate an uncomfortable feeling of wetness given by the topsheet 2 impregnated with menstrual discharge, it is preferred to employ a hydrophobic nonwoven fabric. Alternatively and/or additionally, a degree of the hydrophobic nature may be appropriately adjusted by a suitable surface treating agent in order to promote permeation as well as diffusion of menstrual discharge or thermoplastic synthetic fibers may be mixed with 3 to 20% by weight of hydrophilic fibers such as fluff pulps. The previous description "the plastic film is substantially translucent or opaque" should be understood to mean that such plastic film will effectively prevent the core as well as the high density zones smeared with menstrual discharge from being seen therethrough. The preferable film includes a colored film and transparent film having an aventurine coated surface.

[0018] As will be apparent from the foregoing description, the nonwoven fabric forming the topsheet comprises the high density zones and the low density zones arranged alternately and the high density zones are provided on their upper surfaces with the plastic film bonded thereto so that, even after body fluids have been transferred from the low density zones to the high density zones and the core, the plastic film effectively prevents the high density zones and the core smeared with body fluids being remarkably seen therethrough. In addition, a quantity of body fluids which may stay in the low density zones is relative small and therefore a wearer can dispose the used padding without uncomfortable feeling. A substantially translucent or opaque plastic film may be used as said film to enhance the desired concealing effect.

[0019] In the respective high density zones, the component fibers of the nonwoven fabric may be arranged

with a desired orientation to effectively and entirely utilize each of the high density zones.

Claims

1. A disposable body fluids absorbent padding comprising a liquid-permeable topsheet (2), a liquid-impermeable backsheet (3) and a liquid-absorbent core (4) disposed between these two sheets (2,3), wherein said topsheet (2) comprises a liquid-permeable nonwoven fabric (7) and a liquid-impermeable plastics film (8) integrally bonded to the upper surface of said nonwoven fabric (7) so as to partially expose the upper surface of said nonwoven fabric (7), **characterised in that** each zone (10) of said nonwoven fabric (7) covered with said plastics film (8) is of a higher density than the density of each zone (11) of said nonwoven fabric (7) not covered with said plastic film (8).
2. The padding according to Claim 1, wherein said higher density zones (10) and said lower density zones (11) are alternately arranged transversely of said padding so as to form a striped pattern extending longitudinally of said padding.
3. The padding according to Claim 1, wherein said higher density zones (10) are intermittently arranged transversely and longitudinally of said padding.
4. The padding according to Claim 1, 2 or 3, wherein each of said higher density zones (10) presents a density corresponding to 1.4 times or higher than a density presented by each of said lower density zones (11).
5. The padding according to any preceding Claim, wherein component fibers of said nonwoven fabric (7) in said higher density zones (10) are arranged substantially with a desired orientation.
6. The padding according to any preceding Claim, wherein the top surface of said lower density zones (11) are higher than that of said film (8).
7. The padding according to any preceding Claim, wherein said plastics film (8) is substantially translucent or opaque.

Patentansprüche

1. Wegwerfbares Kissen zum Absorbieren von Körperflüssigkeiten, das eine flüssigkeitsdurchlässige Oberschicht (2), eine flüssigkeitsundurchlässige Unterschicht (3) und einen Flüssigkeit absorbieren-

den Kern (4), der zwischen diesen beiden Schichten (2, 3) angeordnet ist, umfaßt, wobei die Oberschicht (2) einen flüssigkeitsdurchlässigen Vliesstoff (7) und einen flüssigkeitsundurchlässigen Kunststoffilm (8) umfaßt, der an der oberen Fläche des Vliesstoffes (7) derart befestigt ist, dass er die obere Fläche des Vliesstoffes (7) teilweise offenlegt, **dadurch gekennzeichnet, dass** jeder mit dem Kunststoffilm (8) bedeckte Bereich (10) des Vliesstoffes (7) eine höhere Dichte hat als die Dichte eines jeden Bereiches (11) des Vliesstoffes (7), der nicht mit dem Kunststoffilm (8) bedeckt ist.

2. Kissen nach Anspruch 1, wobei die Bereiche mit höherer Dichte (10) und die Bereiche mit niedrigerer Dichte (11) abwechselnd diagonal zu dem Kissen angeordnet sind, so daß sie ein sich längs des Kissens erstreckendes Streifenmuster formen.
3. Kissen nach Anspruch 1, wobei die Bereiche mit höherer Dichte (10) mit Unterbrechungen diagonal und längs des Kissens angeordnet sind.
4. Kissen nach Anspruch 1, 2 oder 3, wobei jeder der Bereiche mit höherer Dichte (10) eine Dichte hat, die 1,4 mal oder mehr einer Dichte, die die Bereiche mit niedrigerer Dichte (11) aufweisen, ist.
5. Kissen nach einem der vorherigen Ansprüche, wobei die Bestandteillfasern des Vliesstoffes (7) in den Bereichen mit höherer Dichte (10) im wesentlichen mit einer gewünschten Ausrichtung angeordnet sind.
6. Kissen nach einem der vorherigen Ansprüche, wobei die obere Fläche der Bereiche mit niedrigerer Dichte (11) höher als die des besagten Films (8) ist.
7. Kissen nach einem der vorherigen Ansprüche, wobei der Kunststoffilm (8) im wesentlichen durchsichtig oder undurchsichtig ist.

Revendications

1. Élément absorbant jetable pour absorber les fluides corporels comprenant une feuille supérieure perméable au liquide (2), une feuille arrière imperméable au liquide (3) et un noyau absorbant le liquide (4) disposé entre ces deux feuilles (2, 3), dans lequel ladite feuille supérieure (2) comprend une étoffe non tissée perméable au liquide (7) et un film plastique imperméable au liquide (8) lié de manière monobloc à la surface supérieure de ladite étoffe non tissée (7) de manière à partiellement exposer la surface supérieure de ladite étoffe non tissée (7), **caractérisé en ce que** chaque zone (10) de ladite étoffe non tissée (7) recouverte avec ledit film plas-

tique (8) est d'une densité supérieure à la densité de chaque zone (11) de ladite étoffe non tissée (7) qui n'est pas recouverte avec ledit film plastique (8).

2. Élément absorbant selon la revendication 1, dans lequel lesdites zones de densité supérieure (10) et lesdites zones de densité inférieure (11) sont arrangées en alternance transversalement audit élément absorbant de manière à former un motif en bandes s'étendant longitudinalement par rapport audit élément absorbant. 5
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3. Élément absorbant selon la revendication 1, dans lequel lesdites zones de densité supérieure (10) sont arrangées de manière intermittente transversalement et longitudinalement par rapport audit élément absorbant. 15
4. Élément absorbant selon la revendication 1, 2 ou 3, dans lequel chacune desdites zones de densité supérieure (10) présente une densité correspondant à 1,4 fois ou plus la densité présentée par chacune desdites zones de densité inférieure (11). 20
5. Élément absorbant selon l'une quelconque des revendications précédentes, dans lequel les fibres de composants de ladite étoffe non tissée (7) dans lesdites zones de densité supérieure (10) sont arrangées substantiellement avec une orientation souhaitée. 25
30
6. Élément absorbant selon l'une quelconque des revendications précédentes, dans lequel la surface supérieure desdites zones de densité inférieure (11) est supérieure à celle dudit film (8). 35
7. Élément absorbant selon l'une quelconque des revendications précédentes, dans lequel ledit film plastique (8) est sensiblement translucide ou opaque. 40

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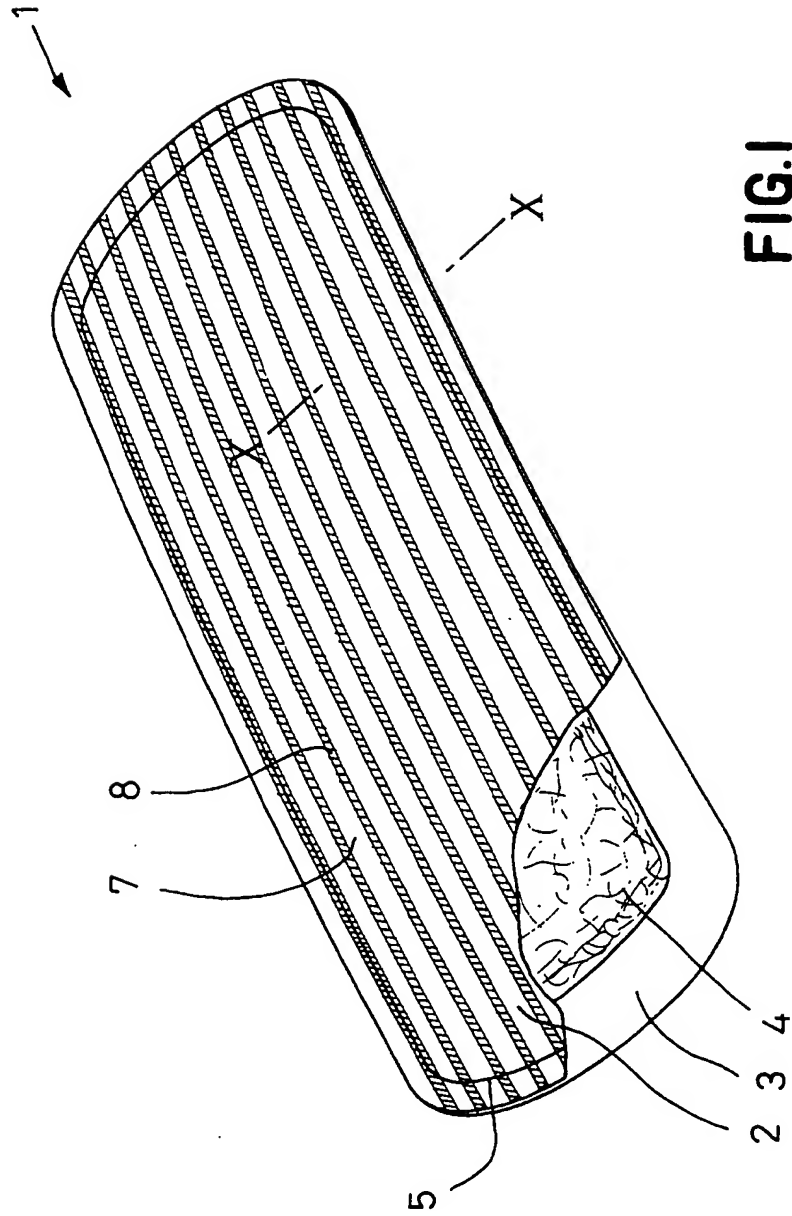


FIG. 1

FIG.2

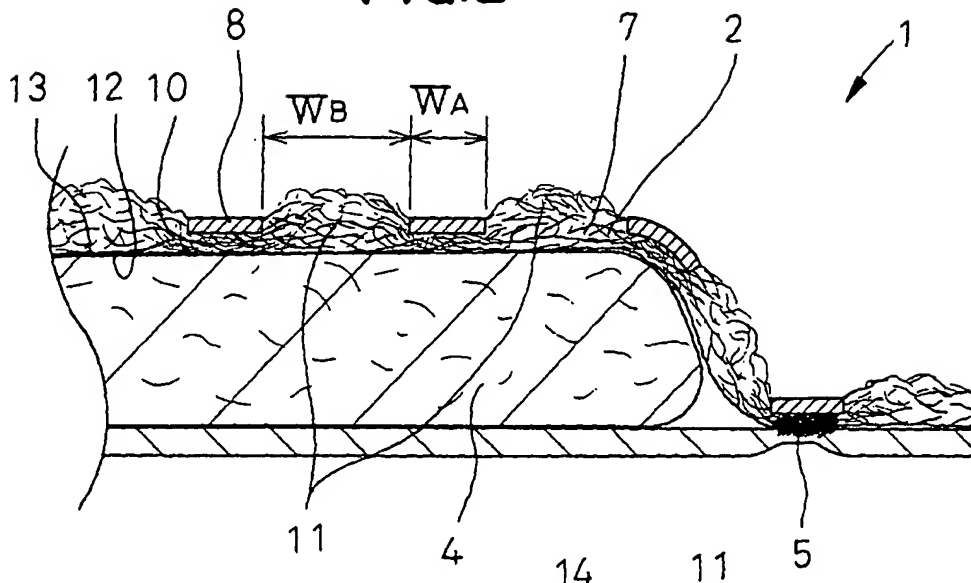
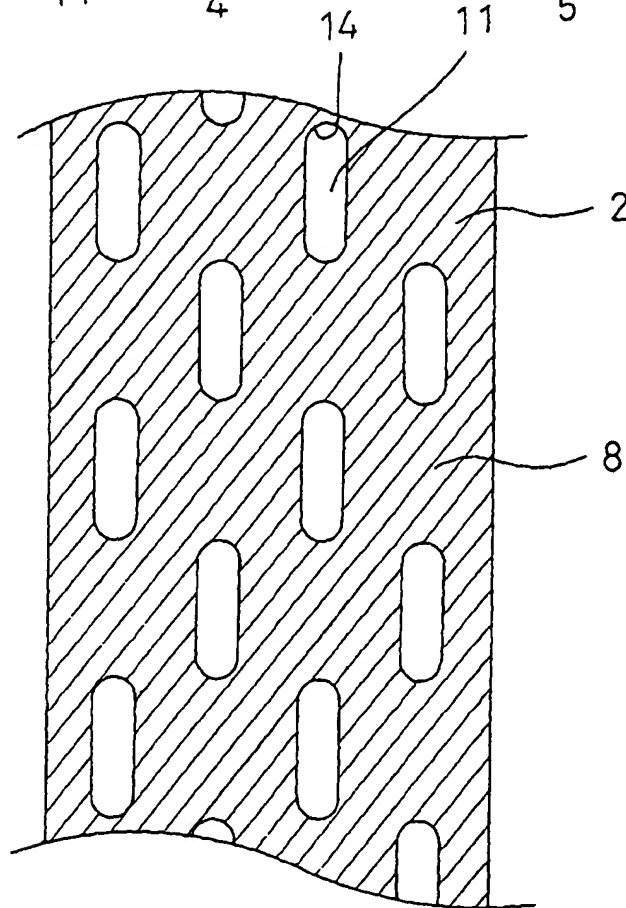


FIG.3





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SUPPLEMENTARY
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Place of search MUNICH		Date of completion of the search 27 March 2002	Examiner Lindner, T
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Valid Claims

1. A sintered porous composite sheet, comprising an A/B-component layer in which A-component having easily fusible properties and B-component having relatively higher thermal stability as compared with said A-component are sintered together and coexist.
2. A sintered porous composite sheet, comprising the two layers of: an A/B-component layer essentially consisting of an A-component having easily fusible properties, and a B-component having relatively higher thermal stability as compared, with said A-component being sintered together and coexisting; and said B-component layer having low thermal deformation.
3. A sintered porous composite sheet, characterized by having a structure in which a first porous layer is laid on top of a second porous layer, said first layer comprising A-component which has easily fusible properties, said second layer comprising B-component which has relatively higher thermal stability as compared with A-component, wherein said composite sheet comprises the three layers of: an A-component layer which is molten and resolidified; an A/B-component layer in which A-component and B-component are sintered together and coexist; and a B-component layer having low thermal deformation.
4. A sintered porous composite sheet according to claim 3 or 4, wherein said first layer is in the form of a corrugated sheet in which crests are formed and mutually in parallel extended, and is continuously or intermittently sintered to said second layer at troughs which are between said crests and mutually adjacent to said crests.

5. A method of producing a sintered porous composite sheet, characterized by the steps of:

mixing a fiber material which A-component having easily fusible properties comprises and a fiber material which B-component having relatively higher thermal stability as compared with said A-component fiber comprises, so as to form a first porous layer in which said fiber material of A-component and said fiber material of B-component are mixed, while a second porous layer is formed, which contains both said fiber material which A-component comprises and said fiber material which B-component comprises, wherein the content of said fiber material which B-component comprises is larger than that of said fiber material which B-component comprises; and

superposing said first layer and said second layer, and thermal treating said first layer and said second layer under such a temperature condition that A-component is hot-molten while B-component is stable and under pressure, and then cooling and solidifying the same, so as to two layer comprising an A/B component layer and a layer which is rich in the content of B-component layer having relatively lower heat-changes.

6. A method of producing a sintered porous composite sheet, characterized by superposing a first porous layer and a second porous layer, said first layer comprising A-component which has easily fusible properties, said second layer comprising B-component which has relatively higher thermal stability as compared to said A-component; thermal treating said first layer and said second layer under pressure and under such a temperature condition that A-component is hot-molten while B-component is stable, so as to melt A-component and move A-component into B-component; and thereafter cooling and solidifying the same so as to form the three layer of a molten and resolidified A-component layer, A/B component layer, and a B-component layer having low thermal changes.

7. A Velcro zipper, characterized in that said second layer of a sintered porous composite sheet of claim 2 or 3 is folded by the heat contraction of said first layer thereof, and said second folded porous layer is formed as female sections.

8. A composite absorber, characterized in that said second layer of a sintered porous composite sheet of claim 2 or 3 has pleats which are folded the heat contraction of said first layer, and a powdered polymeric absorbent is stored on the troughs of said pleats.

9. A water-permeable composite sheet, characterized in that said composite sheet comprises a first web-like hydrophobic layer and a second hydrophilic layer, said first layer comprising a hydrophobic material, said second layer comprising a hydrophilic material which is positioned close to said first layer;

said first layer and said second hydrophilic layer contain a common component comprising an easily fusible material; and

said first layer and said second hydrophilic layer are bonded to each other at sintered sites which are formed by sintering said common component all over the surface of each layer or at part thereof,

whereby said composite sheet has water permeability at said sintered sites.

10. An absorber product which comprises a liquid-impermeable outer-sheet and inner-sheet on the opposite side of a body, and an absorber which is positioned between said outer sheet and said inner sheet, characterized in that said inner-sheet comprises a first hydrophobic porous layer and a second hydrophilic porous layer, said first layer being positioned on the outer side and having easily fusible properties, said second layer being positioned on the inner side; and said absorber product has a liquid-permeable area which is formed by mutually sintering said first hydrophobic layer and said second hydrophilic layer at the center area in a cross direction.

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11. An absorber product which comprises a liquid-impermeable outer-sheet and inner-sheet on the opposite side of a body, and an absorber which is positioned between said outer sheet and said inner sheet, characterized in that said absorber product comprises a liquid-control unit and a liquid-impermeable area, wherein said liquid-control unit is positioned in such a state that it is laid on top of said inner-sheet, and comprises a first hydrophobic porous layer and a second hydrophilic porous layer, said first layer being positioned on the outer-side face and having easily fusible properties, said second layer is positioned on the inner-side face, said liquid-impermeable area being formed by mutually sintering said first hydrophobic layer and said second hydrophilic layer at the center area in a cross direction.